EIGRP Support for Route Map Filtering

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The EIGRP Support for Route Map Filtering feature enables Enhanced Interior Gateway Routing Protocol (EIGRP) to interoperate with other protocols to leverage additional routing functionality by filtering inbound and outbound traffic based on complex route map options. Several extended filtering options are introduced to provide EIGRP-specific match choices.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the Feature Information Table at the end of this document.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Information About EIGRP Support for Route Map Filtering

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EIGRP Route Map Support

EIGRP support for route map filtering enables EIGRP to interoperate with other protocols by filtering inbound and outbound traffic based on route map options. Additional EIGRP-specific match choices are available to allow flexibility in fine-tuning EIGRP network operations.

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EIGRP supports the route map filtering capability that exists for other routing protocols to filter routes being redistributed into their protocol. For more details about understanding and configuring route maps, see the Enabling Policy Routing section of the Configuring IP Routing Protocol-Independent Features module of the *Cisco IOS IP Routing: Protocol-Independent Configuration Guide* .

Match options allow EIGRP to filter internal and external routes based on source protocols, to match a metric against a range, and to match on an external protocol metric.

EIGRP can be configured to filter traffic using a route map and the **redistribute** or **distribute-list** command. Using a route map with the **redistribute** command allows routes that are redistributed from the routing table to be filtered with a route map before being admitted into an EIGRP topology table. Routes that are dynamically received from, or advertised to, EIGRP peers can be filtered by adding a route map option to the **distribute-list** command.

A route map may be configured with both the **redistribute** and the **distribute-list** commands in the same routing process. When a route map is used with a **distribute-list** command that is configured for inbound or outbound filtering, route packets that are learned from or advertised to EIGRP peers can be processed with the route map to provide better control of route selection during the route exchange process. Redistribution serves as a mechanism to import routes into the EIGRP topology table from a routing table. A route map configured with the **redistribute** command adds flexibility to the redistribution capability and results in a more specific redistributed route selection.

The use of route maps to filter traffic is the same for both autonomous-system configurations and named configurations. See the Configuring EIGRP module for more information about autonomous system and named configurations.

Demands for EIGRP to interoperate with other protocols and flexibility in fine-tuning network operation necessitate the capability to filter traffic using a route map.

How to Configure EIGRP Support for Route Map Filtering

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Setting EIGRP Tags Using a Route Map for Autonomous System Configurations

Perform this task to set EIGRP tags for autonomous system configurations using a route map. The EIGRP metrics used for filtering are configured within a route map. The first match clause defines EIGRP routes that contain an external protocol metric between 400 and 600 inclusive; the second match clause defines EIGRP external routes that match a source protocol of BGP and the autonomous system 45000. When the two match clauses are true, a tag value of the destination routing protocol is set to 5. This route map can be used with the **distribute-list** command; see the Example Setting EIGRP Tags Using a Route Map Autonomous System Configuration, page 10 for an example configuration.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
4. **match metric** {*metric-value*| **external** *metric-value*} [+- *deviation-number*]
5. **match source-protocol** *source-protocol* [*autonomous-system-number*]
6. **set tag** *tag-value*
7. **exit**
8. **router eigrp** *as-number*
9. **network** *ip-address*
10. **distribute-list route-map** *map-tag* **in**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**route-map** *map-tag* [**permit**	**deny**] [*sequence-number*] **Example:** `Router(config)# route-map metric-range`	Enters route-map configuration mode.

	Command or Action	Purpose
Step 4	**match metric** {*metric-value*| **external** *metric-value*} [**+-** *deviation-number*] **Example:** `Router(config-route-map)# match metric external 500 +- 100`	Specifies a match clause that filters inbound updates that match an internal or external protocol metric. • *metric-value* --Internal protocol metric, which can be an EIGRP five-part metric. The range is from 1 to 4294967295. • **external** --External protocol metric. The range is from 1 to 4294967295. • **+-** *deviation-number* --(Optional) Represents a standard deviation. The deviation can be any number. There is no default. **Note** When you specify a metric deviation with the **+** and **-** keywords, the router will match any metric that falls inclusively in that range. **Note** The external protocol metric is not the same as the EIGRP assigned route metric, which is a figure computed from EIGRP vectorized metric components (delay, bandwidth, reliability, load, and MTU).
Step 5	**match source-protocol** *source-protocol* [*autonomous-system-number*] **Example:** `Router(config-route-map)# match source-protocol bgp 45000`	Specifies a match clause that matches external routes from sources that match the source protocol. • *source-protocol* --Protocol to match. The valid keywords are **bgp**, **connected**, **eigrp, isis**, **ospf**, **rip**, and **static**. There is no default. • *autonomous-system-number* --(Optional) Autonomous system number. The *autonomous-system-number* argument is not applicable to the **connected**, **static**, and **rip** keywords. The range is from 1 to 65535. There is no default.
Step 6	**set tag** *tag-value* **Example:** `Router(config-route-map)# set tag 5`	Sets a tag value on the route in the destination routing protocol when all the match criteria of a route map are met.
Step 7	**exit** **Example:** `Router(config-route-map)# exit`	Exits route-map configuration mode and returns to global configuration mode.
Step 8	**router eigrp** *as-number* **Example:** `Router(config)# router eigrp 1`	Configures the EIGRP routing process and enters router configuration mode.

	Command or Action	Purpose
Step 9	**network** *ip-address* **Example:** `Router(config-router)# network 172.16.0.0`	Specifies a network for the EIGRP routing process.
Step 10	**distribute-list route-map** *map-tag* **in** **Example:** `Router(config-router)# distribute-list route-map metric-range in`	Filters networks received in updates.

Setting EIGRP Tags Using a Route Map for Named Configurations

Perform this task to set EIGRP tags for named configurations using a route map. The EIGRP metrics used for filtering are configured within a route map. The first match clause defines EIGRP routes that contain an external protocol metric between 400 and 600 inclusive; the second match clause defines EIGRP external routes that match a source protocol of BGP and the autonomous system 45000. When the two match clauses are true, a tag value of the destination routing protocol is set to 5. This route map can be used with the **distribute-list** command, see the Example Setting EIGRP Tags Using a Route Map Named Configuration, page 10 for an example configuration.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
4. **set metric** *bandwidth delay reliability loading mtu*
5. **match ip route-source** {*access-list-number*| *access-list-name*} [*...access-list-number* | *...access-list-name*]
6. **match metric** {*metric-value*| **external** *metric-value*} [**+-** *deviation-number*]
7. **match source-protocol** *source-protocol* [*autonomous-system-number*]
8. **set tag** *tag-value*
9. **exit**
10. **router eigrp** *virtual-instance-name*
11. Do one of the following:
    - **address-family ipv4** [**multicast**] [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number*
    -
    -
    -
    - **address-family ipv6** [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number*
12. **network** *ip-address* [*wildcard-mask*]
13. **af-interface** {**default** | *interface-type interface-number*}
14. **next-hop-self eigrp**
15. **exit-af-interface**
16. **topology** {**base** | *topology-name* **tid** *number*}
17. **distribute-list route-map** *map-tag* **in**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**route-map** *map-tag* [**permit** | **deny**] [*sequence-number*] **Example:** `Router(config)# route-map metric-range`	Enters route-map configuration mode.
Step 4	**set metric** *bandwidth delay reliability loading mtu* **Example:** `Router(config-route-map)# set metric 10000 10 255 1 1500`	(Optional) Sets the metric value for EIGRP in a route map.
Step 5	**match ip route-source** {*access-list-number*| *access-list-name*} [*...access-list-number* | *...access-list-name*] **Example:** `Router(config-route-map)# match ip route-source 5 80`	Redistributes routes that have been advertised by routers and access servers at the address specified by the access lists.
Step 6	**match metric** {*metric-value*| **external** *metric-value*} [**+-** *deviation-number*] **Example:** `Router(config-route-map)# match metric external 500 +- 100`	Specifies a match clause that includes EIGRP routes that match an internal or external protocol metric. • *metric-value* --Internal protocol metric, which can be an EIGRP five-part metric. The range is from 1 to 4294967295. • **external** --External protocol metric. The range is from 1 to 4294967295. • **+-** *deviation-number* --(Optional) Represents a standard deviation. The deviation can be any number. There is no default. **Note** When you specify a metric deviation with the **+** and **-** keywords, the router will match any metric that falls inclusively in that range. **Note** The external protocol metric is not the same as the EIGRP assigned route metric, which is a figure computed from EIGRP vectorized metric components (delay, bandwidth, reliability, load, and MTU).

	Command or Action	Purpose
Step 7	**match source-protocol** *source-protocol* [*autonomous-system-number*] **Example:** `Router(config-route-map)# match source-protocol bgp 45000`	Specifies a match clause that includes EIGRP external routes that match a source protocol. • *source-protocol* --Protocol to match. The valid keywords are **bgp**, **connected**, **eigrp**, **isis**, **ospf**, **rip**, and **static**. There is no default. • *autonomous-system-number* --(Optional) Autonomous system number. The *autonomous-system-number* argument is not applicable to the **connected**, **static**, and **rip** keywords. The range is from 1 to 65535. There is no default.
Step 8	**set tag** *tag-value* **Example:** `Router(config-route-map)# set tag 5`	Sets a tag value on the route in the destination routing protocol when all the match criteria of a route map are met.
Step 9	**exit** **Example:** `Router(config-route-map)# exit`	Exits route-map configuration mode and returns to global configuration mode.
Step 10	**router eigrp** *virtual-instance-name* **Example:** `Router(config)# router eigrp virtual-name1`	Configures the EIGRP routing process and enters router configuration mode.
Step 11	Do one of the following: • **address-family ipv4** [**multicast**] [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number* • • • • **address-family ipv6** [**unicast**] [**vrf** *vrf-name*] **autonomous-system** *autonomous-system-number* **Example:** `Router(config-router)# address-family ipv4 autonomous-system 45000`	Enters address family configuration mode to configure an EIGRP IPv4 or IPv6 routing instance.

	Command or Action	Purpose
Step 12	**network** *ip-address* [*wildcard-mask*] **Example:** `Router(config-router-af)# network 172.16.0.0`	Specifies a network for the EIGRP routing process.
Step 13	**af-interface** {**default** | *interface-type interface-number*} **Example:** `Router(config-router-af)# af-interface default`	Enters address family interface configuration mode to configure interface-specific EIGRP commands.
Step 14	**next-hop-self eigrp** **Example:** `Router(config-router-af-interface)# next-hop-self eigrp`	Enables EIGRP to advertise routes with the local outbound interface address as the next hop.
Step 15	**exit-af-interface** **Example:** `Router(config-router-af-interface)# exit-af-interface`	Exits address-family interface configuration mode.
Step 16	**topology** {**base** | *topology-name* **tid** *number*} **Example:** `Router(config-router-af)# topology base`	Configures an EIGRP process to route IP traffic under the specified topology instance and enters address family topology configuration mode.
Step 17	**distribute-list route-map** *map-tag* **in** **Example:** `Router(config-router-af-topology)# distribute-list route-map metric-range in`	Filters networks received in updates.

Configuration Examples for EIGRP Support for Route Map Filtering

- Example Setting EIGRP Tags Using a Route Map Autonomous System Configuration, page 10

- Example Setting EIGRP Tags Using a Route Map Named Configuration, page 10

Example Setting EIGRP Tags Using a Route Map Autonomous System Configuration

The following example shows how to configure a route map to match an EIGRP external protocol metric route with an allowable deviation of 100, a source protocol of BGP, and an autonomous system 45000. When the two match clauses are true, the tag value of the destination routing protocol is set to 5. The route map is used to distribute incoming packets for an EIGRP process.

```
Router(config)# route-map metric-range
Router(config-route-map)# match metric external 500 +- 100
Router(config-route-map)# match source-protocol bgp 45000
Router(config-route-map)# set tag 5
Router(config-route-map)# exit
Router(config)# router eigrp 1
Router(config-router)# network 172.16.0.0
Router(config-router)# distribute-list route-map metric_range in
```

The following example shows how to configure a route map to match EIGRP routes with a metric of 110, 200, or an inclusive range of 700 to 800. When the match clause is true, the tag value of the destination routing protocol is set to 10. The route map is used to redistribute EIGRP packets.

```
Router(config)# route-map metric-eigrp
Router(config-route-map)# match metric 110 200 750 +- 50
Router(config-route-map)# set tag 10
Router(config-route-map)# exit
Router(config)# router eigrp 1
Router(config-router)# network 172.21.1.0/24
Router(config-router)# redistribute eigrp route-map metric-eigrp
```

Example Setting EIGRP Tags Using a Route Map Named Configuration

The following example shows how to configure a route map to match an EIGRP external protocol metric route with an allowable deviation of 100, a source protocol of BGP, and an autonomous system 45000. When the two match clauses are true, the tag value of the destination routing protocol is set to 5. The route map is used to distribute incoming packets for an EIGRP process.

```
Router(config)# route-map metric_range
Router(config-route-map)# match metric external 500 +- 100
Router(config-route-map)# match source-protocol bgp 45000
Router(config-route-map)# set tag 5
Router(config-route-map)# exit
Router(config)# router eigrp virtual-name

Router(config-router)# address-family ipv4 autonomous-system 45000

Router(config-router-af)# network 172.21.1.0/24
Router(config-router-af)# topology base
Router(config-router-af-topology)# distribute-list route-map metric_range in
```

The following example shows how to configure a route map to match EIGRP routes with a metric of 110, 200, or an inclusive range of 700 to 800. When the match clause is true, the tag value of the destination routing protocol is set to 10. The route map is used to redistribute EIGRP packets.

```
Router(config)# route-map metric_eigrp
Router(config-route-map)# match metric 110 200 750 +- 50
Router(config-route-map)# set tag 10
Router(config-route-map)# exit
```

```
Router(config)# router eigrp virtual-name
Router(config-router)# address-family ipv4 autonomous-system 45000
Router(config-router-af)# network 172.21.1.0/24
Router(config-router-af)# topology base
Router(config-router-af-topology)# distribute-list route-map metric-range in
```

AdditionalReferences

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
EIGRP overview and configuration	The Configuring EIGRP section of the *Cisco IOS IP Routing: EIGRP Configuration Guide*
EIGRP commands including syntax, usage guidelines, and examples	*Cisco IOS IP Routing: EIGRP Command Reference*

Standards

Standard	Title
None	--

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
None	--

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for EIGRP Support for Route Map Filtering

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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Table 1 Feature Information for EIGRP Support for Route Map Filtering

Feature Name	Releases	Feature Information
EIGRP Support for Route Map Filtering	12.2(33)SRA 12.2(33)SRE 12.2(33)SXH 12.2(33)XNE 12.3(8)T 15.0(1)M 15.0(1)S	The EIGRP Support for Route Map Filtering feature enables EIGRP to interoperate with other protocols by filtering inbound and outbound traffic based on complex route map options. Several extended filtering options are introduced to provide EIGRP-specific match choices. The following commands were introduced or modified by this feature: **match metric** (IP), **match source-protocol**, **show ip eigrp topology**. In Cisco IOS Release 15.0(1)M, 12.2(33)SRE, and 12.2(33)XNE the following command was introduced or modified for this feature: **show eigrp address-family topology**